AUGUST 1982

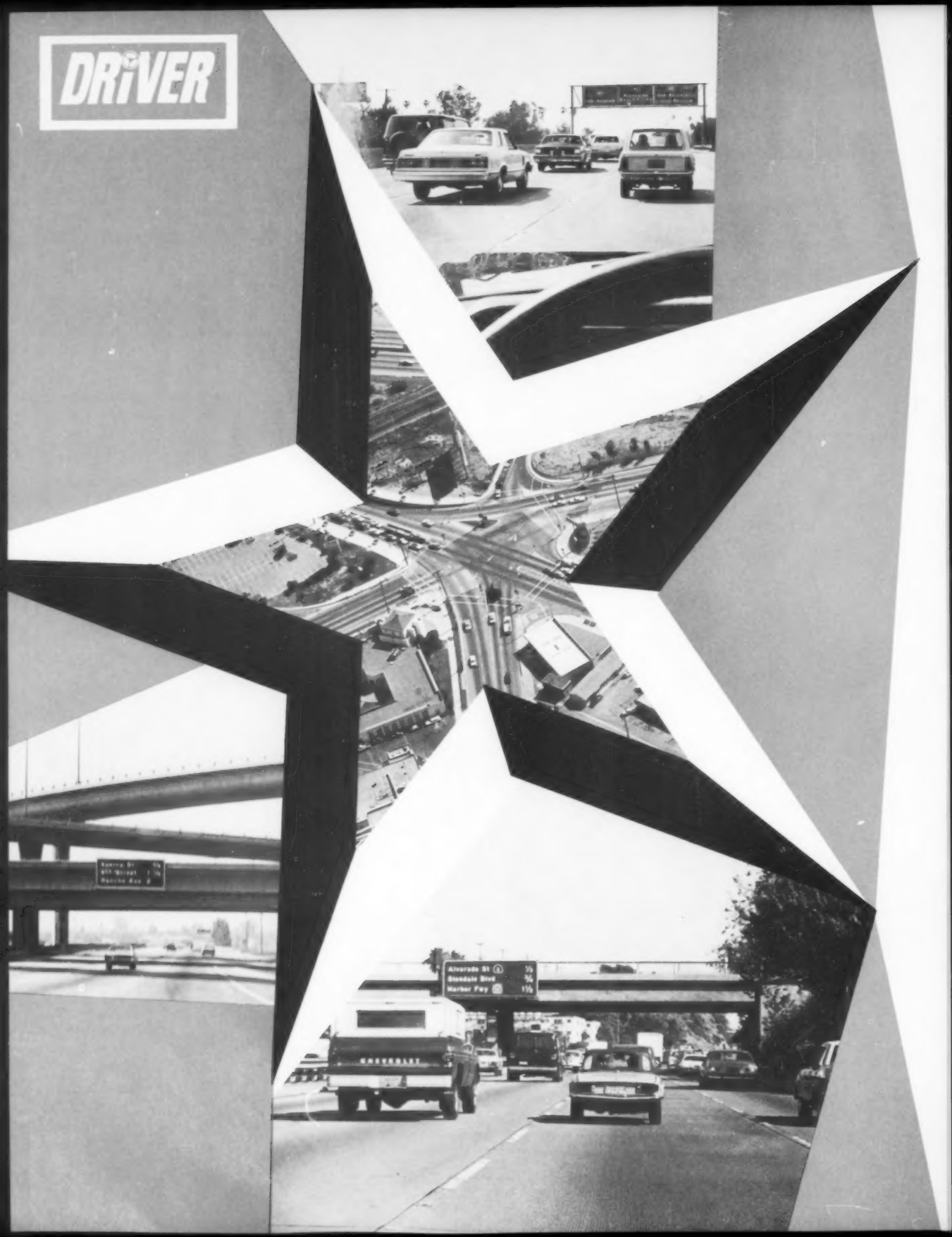
DRiVER

FREEWAY STAR

DETROIT IS PLANNING AHEAD

FRANK AND STEIN

THE BACKYARD MECHANIC


DRIVER
Alvarado St 1 ½
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FREEWAY STAR

and how to be one

They say familiarity breeds contempt. The more accustomed you become to a thing, the less you think about it and the more you take it for granted. That includes people, labor-saving devices and — since we deal with things automotive here — driving.

You can get used to *anything*, no matter how bewildering it may seem at first. Take driving on the freeway as an example and listen to a couple of drivers' thoughts.

The inexperienced driver: "What am I doing here? I didn't know there were this many cars in the entire world, let alone in this city! Not only do they move too fast, but they pull in front of me if I leave more than three feet of space ahead. I can't get out of this lane because I'm not willing to take the chance of a collision when everyone else is moving so fast . . ."

The "old hand": "Another traffic jam . . . one of these days I'm going to find another route to work . . . Hey, there's a crack in the vinyl on my dashboard. It must have been pretty hot out at noon . . . If I stop at the supermarket and get some cash I can gas up the car and get it washed before I go over to the movie . . . Is my checkbook in the glove box? . . . Let's see . . . three tapes, a map and broken pencil . . . an old package of gum . . ."

The first one is scared and jumpy and perhaps prone to mistakes because of it. The second one is so relaxed and nonchalant that he might have an accident through not paying attention to the traffic. Funny thing is, the first one might turn into someone like the second, given some time and experience. But either example is a good one to follow. Perhaps some of you DRIVER readers fit into one category or the other.

For those of you at the fear end of the scale, take our word that freeways should not be avoided. There are many cars and they go at high speeds, true. But it is also true that freeways are safer routes to travel than most city streets. That's right — safer. The reason is that statistics show most auto accidents happen at intersections. Freeways, whatever their hazards, don't have intersections. With the proper skills, you can make freeway driving a no-sweat experience.

Signs like this one on urban freeways will help you find your proper exit. You should know the names of the exits before and after the one you want.

For those of you who have become too relaxed about driving the superhighways: Please, either get alert or stay home and play video games. That way you won't hurt yourself or anyone else.

A freeway is no place for timidity or for overconfidence. Even if you're in-between, you may need some of these pointers. You may not be so good as you think you are, which is another example of overconfidence.

So dust off your '69 Dart and let's go at it.

First things: Freeways, or superhighways, are those big, concrete routes in and around the large cities. They are like interstate highways, but with more lanes, more exits and entrances and many, many more cars per square mile.

Freeways are the best roads of the large metropolitan areas. They connect the city streets and provide easy, quick access to just about anywhere you want to go, with a minimum expense in time. Their convenience makes them very popular with the motoring public, and this in turn can make them hazardous places, because of the vast numbers of cars on them and the speed of travel.

continued

DRIVER

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FOR THE MILITARY DRIVER

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VOLUME 16 NUMBER 3

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THE EDITOR SPEAKS

DOUBLE CLUTCH

BUCKLING UP ON THE TELLY

We were watching a great old movie on TV the other night — "The Maltese Falcon" with Humphrey Bogart — and got to talking about all the smoking that was going on. Mostly cigarettes, although Sydney Greenstreet favored big cigars. The smoking was attention-getting because it is rare to see anyone smoking on TV these days. The Surgeon General and other groups put pressure on television producers years ago to stop showing smoking as an acceptable habit.

Now Raymond A. Peck (administrator of the National Highway Traffic Safety Administration) has asked TV producers to depict characters in their productions as seat-belt users. "An actor wearing belts can have an important effect in ratifying and reinforcing belt usage," says Peck.

Lorimar Productions, famous for Dallas, Knots Landing, and Falcon Crest, has pledged its support to Peck. David Jacobs, Lorimar's executive producer, says characters are not shown buckling belts or unlocking car doors because it takes up valuable screen time. He adds, however, that "in driving shots we can show people buckled up. It doesn't cost us anything and it may save lives. The more we use it, the more we're saying about routine belt use."

The Motor Vehicle Manufacturers Assn. is committed to showing drivers and passengers in their new commercials as belt users, too.

See if you notice it happening, come Fall.

freeway star

continued

If you want the "Barton Road" exit, now is a good time to get into the right-hand lane in preparation for the exit.

Driving on them requires a few special techniques, but more importantly it requires care and alertness.

It also requires planning, so unless you know exactly the road you're taking and where you're going, plan ahead. Freeways are very well marked with signs for cross streets, but that's no help if you don't know the area well. If you don't, try using a map. As an aid to finding your way around, nothing beats a map. There's no great trick to reading maps; just use the index and a little common sense. Find the general area of the place you want and get used to the streets around that place. It'll help when you get on the road.

Mark up the map. You can always get another one for the next trip. If you have someone along who can serve as "navigator," have him or her watch for your destination.

Getting on: Once you know where you're going and how to get there — and you've found the freeway — it's as simple as getting on the freeway and going. Except that none of it is simple and entering the freeway may be the trickiest part.

The freeway on-ramp severely frightens many novice drivers. Even experienced freeway drivers have great respect for the on-ramps, but they know that entering the freeway can be done fairly easily. Here's how.

Freeway on-ramps, both the cloverleaf variety and the straight ones, usually contain an acceleration lane at the end. Accleration lanes allow you to increase your speed to match the traffic on the freeway. Then, all you have to do is move into a convenient space in the traffic flow.

"But what if there isn't a convenient space to jump into?" you ask. Trust us, in most cases other than severe traffic jams there'll be a place for you. (And in the severe traffic jams the cars move so slowly that you can get in anyway.) You just have to match your speed to the traffic and move right in. If you hesitate you'll tie up those behind you who are also waiting to get on.

A lot of people make the mistake of taking the on-ramps slowly, thinking they need a very long gap in which to enter the traffic. This is not the proper way to get on a freeway. First, such long gaps are not common, and second, you don't need them.

If you take the on-ramp slowly, or even stop at the top to wait for what you consider a suitable gap, you'll have to accelerate that much faster when the gap appears. That's easy for a powerful sedan, but not too great for one of today's subcompacts.

Use the ramp and the acceleration lane to bring your car up to the highway speed and then merge into the

continued

Your exit is the next one, but the sign mentions the name of the town, not the street. Don't be confused; know where you're going before you start out.

traffic. You'll need to look for your gap, watch the cars on the freeway, and watch the road all at the same time, with quick glances back and forth. It sounds difficult, but it isn't when you get used to it.

Use your car's turn signals to signal your intentions. You might think your presence on the on-ramp will alert the other drivers you're getting on, but give them the extra assurance of your signal.

If you should get stopped at the top of the ramp and can't get in, you'll have to wait for that large gap, or for some kind motorist to move over. Don't try to force your way in where there isn't room. You might scare another driver enough to cause an accident.

In short, don't be timid but don't be foolhardy either.

Lane to lane: There are many places on the freeway where an on-ramp acceleration lane leads directly to a deceleration lane for an off-ramp. You might find one of these annoyances at a cloverleaf interchange, but they're not limited to there. Such places are confusing and hazardous in the extreme. Traffic criss-crosses and those trying to accelerate into the flow of traffic have to whip around those trying to get off the highway.

The only advice we can offer in situations when you encounter the acceleration/deceleration lane is to be careful. When possible, avoid this kind of area like the plague.

Okay, now that you're on the freeway you need to get into a lane that will provide you with some room.

Freeway lanes work like this: The left lane is for the fast-moving traffic. The right lane is for the slow-moving traffic. The middle lanes, if any, are the "through lanes," for traffic that is

This interchange is a cloverleaf, so-called because it looks like one.

See? You weren't sure and you've missed the exit you wanted. If you swerved to the right now you might lose control of the car. Go to the next exit and backtrack.

continuing on rather than entering or exiting.

Pick the lane that will allow you the space you need and give the fewest problems. If you're new to the freeways or don't feel comfortable on them, you might use the right or "slow" lane.

But remember the right lane is also the one in which cars enter and leave the freeway. If you like to travel in the right lane, be prepared for the car ahead to slow for an exit, or for a car to enter on your right, or for a car on your left to move over to exit the freeway.

The left lane on the freeway is for the fast-moving traffic, the middle lane (or lanes) is for through traffic and the right lane is for the slow-moving traffic and those entering and exiting the expressway.

If an exiting car goes in front of you and slows too much, move to another lane when it's safe to do so. And if a car is entering, move over to allow him a gap to get in. Who knows? You might start a trend and somebody might let you in next time.

The other lanes: You could also drive in the left ("fast") lane. Actually, the left lane is designed to serve as a passing lane, so you should keep to the right to allow the faster motorists to go by. If someone tailgates you in the left lane (or in any lane for that matter) move over, even if you're doing the legal speed limit. This type wants to get around you and go even faster, so let him. He'll be the one who gets a ticket.

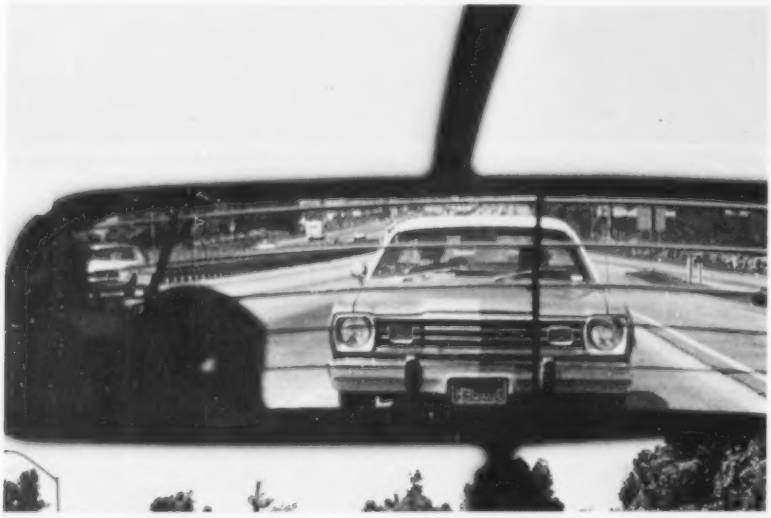
If you are the faster motorist (legally, we hope) watch everyone carefully and never tailgate anyone. You know how being tailgated makes you feel, so don't pull that nonsense on anyone else.

We feel the middle lanes or "through lanes" are the best to travel in. Traffic moves well in them and there are more directions to go in the event of trouble. Whatever lane you choose, always watch for any quick

continued

In the right lane of the freeway you might have to slow for cars that are entering. Move over one lane to the left when you can. Those entering will get on easier and you won't have to slow down.

The driver should leave the map-reading to his passenger while the car is in motion. At highway speeds he can't risk looking away long enough to find something in the small print on a road map.



Here in your mirror is a tailgater. When you are being followed too closely, move over one lane when you can and let the tailgater go ahead. Remember how angry this makes you and don't do it to anybody else.

This long lane you are in now is the deceleration lane. It gives you some space to slow the car before you reach the exit ramp.

movements by other cars. Anyone could dart in front of you and spoil your grillwork and your day. Plan for the unexpected by always looking for an escape route.

Try to keep your speed steady; move along at the rate most of the other cars are going. This will keep an even space between you and the other cars, and your gas mileage will be better.

Passing and interchanges: Passing a slower-moving vehicle on the freeway is easy because you have more than one lane moving in the same direction. But remember there are more people around you than there are on a city street. All of them need to know what you're going to do, so use the turn signals. Flash them to show your intention to pass or to change lanes, and use them when entering or leaving the freeway.

Whenever you signal, look over your shoulder toward the lane you'll be moving into. You'll very often find someone in your blind spot when you're on the freeway, and sudden lane changes without looking can cause serious accidents. Always cancel your signal after you make your move.

Those freeway interchanges with all the ramps look forbidding, but they're really simple, and handy too. If you make sure you're in the correct lane to change freeways (or out of the way if you want to stay on this one) you're okay. The interchanges allow you to maintain your speed and get into traffic on the other freeway with a minimum of hassle.

This way to the egress: Now that you're on the way, you can go with the flow and watch for your exit. Most freeways will be marked well enough so that you'll get plenty of advance warning that your exit is coming up. The signs will say "Smith St. 1½ miles," "Smith St. ¼ mile," "Smith St. Right Lane," "Smith St. Next Exit."

But despite all this you may for some reason miss the exit. Perhaps you're busy watching and avoiding some erratic driver, or maybe you can't get into the right lane because of a mass of autos there. Or maybe your freeway isn't as well marked as it should be. You might even be inattentive, though we hope not.

If you miss it, don't worry. Just go to the next exit and get off there. There will probably be signs around to show how to get back on the freeway, going in the opposite direction. If not, stop in at a service station and ask. Then you can get back on the freeway and go back to the right exit. Or, if it's close or somehow more convenient, you can backtrack on the city streets.

Some people — believe it or not — will stop on the freeway and back up to reach the exit they missed. Of course you realize the dangers involved there.

Getting back on the track depends on how far wrong you were, and whether you got off after your desired exit, or before, as sometimes happens. You should know the names of the exit just *before* and the one just *after* yours. When you see a sign for the exit before, you know yours is coming up next. If you see the one after, you know you've missed it.

Once you're in the right lane and onto the correct off-ramp, you've got it made. Except for your speed. You're now leaving the high-speed traffic of the freeway for the moderate speeds of the city streets. Slow down. There will be a speed limit sign on the ramp, so decelerate to that speed.

You might be able to take the ramp at a higher speed, but it's a bad idea. A friend of ours failed to slow on an off-ramp. Because of his speed, he couldn't make the curve at the end of the ramp and hit the curbing, depositing the front half of his car on the grass. He was lucky all he did was mess up the front-end alignment.

continued

On the on-ramp, watch the freeway traffic for a gap that you can accelerate into. If you move too slowly you'll stop the traffic behind you and make it next to impossible for them to get on.

If your car breaks down on the freeway, go find a phone for a tow truck rather than trying to make repairs yourself by the side of the road. Some freeways have call boxes like this one for just such an emergency.

Problems: We'll just touch on some special cases you'll want to be familiar with. One is driving in poor visibility. This includes driving at night, or in bad weather, be it rain, snow or fog. Any time the visibility is less than perfect, slow down.

Another special problem is the breakdown. If your car breaks down on the freeway, get out and get away from the car. Go find a phone and call a wrecker. Trying to work on your car on the shoulder of the freeway is too dangerous; many people are killed by careless (or drunk) motorists.

Despite their good reputation, freeways are occasionally the scene of accidents. And accidents with that many cars around can be catastrophic. To avoid getting into one that's already taken place, watch far ahead. If someone's brake lights flash on, believe them. Slow down; there may be an accident ahead. And if there is, please don't watch the clean-up as you pass by. Slow down as much as necessary, but watch what you're doing. If you don't you might start *another* accident.

We can't stress the attention bit too strongly. When you're on the freeway, your attention should be directed totally on your driving. Sounds logical enough, but how many times have you seen some bozo trying to wiggle out of his jacket with one arm and drive with the other? Or grope for something he dropped on the floor. Or roll down the window on the other side of the car. And then there's the one who can't talk to a passenger without looking at him, and spends more time looking inside the car than over the hood.

Given the choice of the scared guy or the too-relaxed one, we'll take the scared one — at least he's watching the road.

IN THE LONG RUN . . .

Although this article has been about in-city freeways, we couldn't go away without a few words on interstate freeways.

Remember the two drivers at the beginning? Which of the following sounds more like your thoughts as you travel long distance on the freeway?

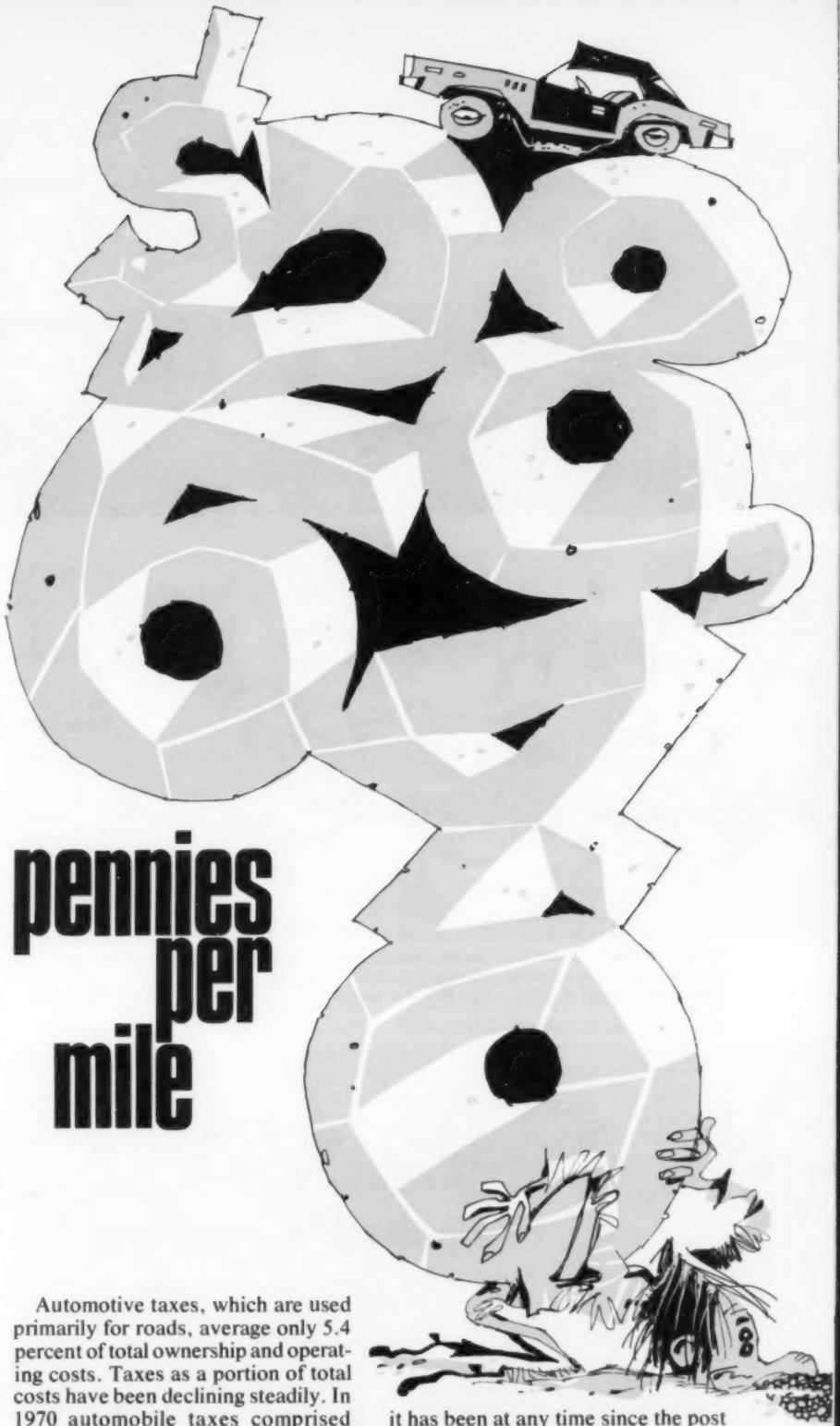
Mode 1: "That guy to the left is crowding the line a little. Maybe I should slow down and give him room in case he's thinking of changing lanes. . . . The guy ahead is passing a sign. One-thousand-and-one, one-thousand-and-two. Yeah, there's enough room between us. . . . There's a mileage sign: "Albuquerque 183 miles" That's around three and a half hours of driving. At least a couple of stops just to keep me alert. In fact I'd better find a place to stop pretty soon and stretch . . ."

Mode 2: ". . . Whoever told that guy he could sing? There's got to be something better on the radio than that . . . trouble is, I'm too far away from a big city . . . Why's that turkey doing 50 in the fast lane? Oh, he's following a trailer. Now I have to sit on his bumper for a while until all the other cars pass and I can get out of this lane . . . There's the sign: "Las Vegas 203 miles." I can make that in three hours if I don't have to mess with too many clods like this one with his trailer. . . ."

In the first case the driver is watching the other traffic, maintaining a safe following distance, traveling at a reasonable (and legal) speed, and stopping every hour or two for rest. In the second instance, the driver is not paying attention to his driving or the traffic around him, he's speeding and following too close, and he's not resting at all.

We think you get the message.

pennies per mile



Next to having an accident one of the most terrifying aspects of owning an automobile is the cost.

If you buy an intermediate-sized American car and drive it 120,000 miles over a 12-year period, it will cost you $28,640, or 23.8 cents a mile according to the Department of Transportation. Similarly it now costs 26.6 cents per mile to drive a large size car; 21.4 cents for a compact; 18.9 cents for a subcompact, and 33.2 cents per mile for a van.

For the intermediate size car purchased for $7,449 and driven 120,000 miles over a 12-year period, it will cost about $7,699 (excluding taxes) for some 6,314 gallons of gasoline; about $6,033 to keep it maintained and in repair; $3,991 to insure it; $939 for parking and tolls, and $1,586 in automotive taxes.

These figures are based on a study tracing selected vehicles and their costs through a 12-year lifetime of 120,000 miles, which is considered reasonable from a study of odometer readings and the average age of passenger cars in use up to and including mid-1981. Usually, a car or van passes through three or more owners during its life span.

Other terrifying facts involving costs include:

Depreciation is still the single greatest cost of owning and operating most passenger vehicles during a 12-year life span. The cost of gasoline, however, is overtaking depreciation cost and exceeds it for intermediate-sized vehicles.

The "annual trader" drives a current model car all the time, but depreciation for an intermediate size automobile will cost him about $22,188 over a 12-year period since a new car depreciates most in the first year.

The "two-year trader" pays about $17,394 in depreciation, and even more can be saved by becoming a "three-year trader." However, after the first year, a series of outlays for tire replacement, repairs and incidentals begins to offset the savings in depreciation.

The difference in gasoline costs alone between the 1981-model, large-size car and the subcompact over the lives of the vehicles is $3,741 (including federal and state taxes of four cents and nine cents per gallon respectively). Over the first three years, gasoline will cost $1,763 more for the large car than for the subcompact.

Automotive taxes, which are used primarily for roads, average only 5.4 percent of total ownership and operating costs. Taxes as a portion of total costs have been declining steadily. In 1970 automobile taxes comprised about 12 percent of the total cost of owning and operating a car.

The average age of an American car — 6.6 years — is higher now than it has been at any time since the post World War II period. In other words, always consider the cost of *maintenance* just as you consider the cost of gasoline — ESSENTIAL!

Sunday drives used to be pleasure tours of the local countryside. Today they're part of long-haul vacationing.

Good advice for racers and vacations would be to avoid tight bunches of cars because of the susceptability to the mistakes of others. The driver in this 125mph wreck walked away with a mild concussion instead of sever injuries thanks to exceptional safety equipment that he employed.

Vacationers and race drivers must plan their Sunday drives in order to be where they want to be at the end of the day. Less than 15 miles from the finish of a 248.9-mile race, Tim Richmond (#2) passes race-long leader Terry Labonte for the win.

SUNDAY

There was a time not so long ago that the Sunday afternoon drive was very much a part of the American scene. The entire family would pile into the family sedan — that had been washed and waxed the day before — and tool around town, or more likely, out into the open countryside. It happened every Sunday from the first signs of spring until just after the first snows blew. Sometimes there'd be a picnic or the biggie — ice cream cones all around.

But times have changed. Today, if the car moves at all on Sunday it is to church or a local ballgame. Except in the summer when driving on Sunday may be part of a mini-vacation, or either end of the major vacation.

Nevertheless there are a group of men who specialize in the Sunday drive. They're National Association of Stock Car Auto Racing (NASCAR) Grand National racers who 30 Sundays a year push their Ameri-

DRIVE

Pushing hard wears drivers and cars — vacationers and racers alike — to the point of failure. Six of these front-running 10 first-lap competitors weren't around at the end of this Sunday drive because they lunched their engines: a fate that could ruin a vacation.

can-built sedans around tracks from Daytona Beach to Pocono and Charlotte to Riverside.

Although they are aiming for nearly $8 million in prize money, the racer's Sunday drive isn't that much different than your vacation driving should be.

You can bet that every NASCAR driver's Sunday doesn't start until the racing vehicle itself has had a complete going over by the best mechanics available. Likewise your vacation shouldn't start until your car has had a complete auto prep. Tires, hoses, belts, tune-up, lube, oil filters, steering, transmission, suspension, exhaust, electrics and brakes have to be gone over and brought up to their best performance on the race car as well as the vacation hauler.

The racer plans his Sunday drive. He knows where he wants to be at each point during the race and has a good idea of how long it is going to take him to get there. Your vacation should be planned, too. You want to know where you are going, map out the route and set up a time table.

The racer knows how far he can go on a tank of gas and how long it will take to get from one tank to another. He knows that if he drives reasonably with stops for fuel and tires he'll be in the thick of the competition when the checkered flag is waved. He knows that emergencies don't happen on schedule, so he'll have to deal with them as they occur.

You also know how far your car will go on a tank of gas and how far you can go in a certain time span. You know that if you drive reasonably with stops for gas, food and sight seeing you can be at a certain point when you want to be there. Then you add a little extra for those surprises that can happen to delay you.

At first glance you might feel that the big difference between the racer and the vacationer would be speed, but it isn't — really. Pushing hard wears a driver down, regardless of whether he is a racer or a vacationer. Speed is hard on the car and decreases gas mileage. But worst of all, fast driving causes tempers to flare which leads to accidents.

The mark of a really good driver — racer or vacationer — is smoothness and steadiness, not speed. The good race and vacation drivers can cover the maximum *safe* distance in the minimum time. That is, after all, what racing is about; getting from the start to finish before anybody else safely. And that same thing is true of vacationing; you want to arrive at your destination and back home again safely, without having spent the entire day or two weeks behind the wheel.

The Sunday drive just isn't what it used to be. However, there's a chance that Sunday drivers may have improved. They will be even better when, like the race drivers, they always buckle up.

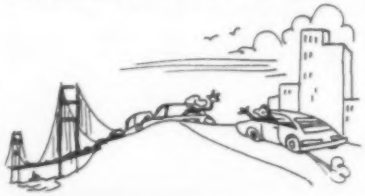
BRIDGES

The Secretary of Transportation has told Congress that nearly half of all highway bridges in the U.S. are now officially classified as deficient or obsolete and the number is rising.

A structurally deficient bridge is one that has been restricted to light vehicles only, is closed to traffic, or must be rehabilitated immediately to stay open. A functionally obsolete bridge is one whose narrow lanes, load-carrying capacity, clearance, or approach roadway alignment can no longer safely serve its current traffic load. The Secretary says it could cost $47.6 billion to replace or rehabilitate all the deficient and obsolete bridges.

Over half the total number of deficient bridges are located in the 10 states of Indiana, Iowa, Kansas, Mississippi, Missouri, Nebraska, New York, North Carolina, Oklahoma, and Texas. The greatest number is in Texas. Age is a factor in bridge deterioration. More than a third of the nation's bridges are over 40 years old.

Do you use a bridge on your daily commute? Do you think it's safe? Can you find another route that would allow you to by-pass it?



IS FASTER BETTER?

The Minnesota Safety Council recently duplicated an experiment that used to be done a lot in Europe. Two drivers traveled over the same 1,000 mile route in similar vehicles. The fast driver passed 2,000 cars, braked 1,339 times and covered the distance in 20 hours, 12 minutes. The slow driver flowed with traffic, passed only 13 cars and braked 652 times. It took him 20 hours, 43 minutes; 31 minutes longer than the fast driver. The faster car used 10 gallons more gas, and the driver's pulse rate rose because of the tension and risks he had taken.

CHECK THAT DODGE TRUCK STEERING GEAR-BOX

If you own a 1979-1981 Dodge Truck 4x4 Crew Cab Model W250 (Powerwagon) you might want to do the same repair to your steering gearbox that Air Force Logistics officials have ordered. It seems the unit has a tendency to come loose, resulting in partial loss of control.

To prevent this from happening, remove the screws, locknuts and lock washers which attach the mounting bracket to the frame and the gearbox to the mounting bracket. Then clean the screws and nuts of all grease and oil.

Reassemble the gearbox to the mounting bracket, applying a sealing compound such as Loctite, and torque to 70-90 foot-pounds. Position the mounting bracket and steering gearbox to the frame, apply Loctite, and secure the mounting bracket to the frame with 110-120 foot-pounds torque.

CHILD RESTRAINTS

Parents buy child restraints to protect their children from injury in case of a traffic accident. Most parents don't know that some accidents can actually be prevented if children are restrained in the car. Children who ride restrained are better behaved and present fewer distractions to the driver.

North Carolina includes investigating officers' narrative descriptions of collisions in its traffic accident reports. In a four-year period, the University of North Carolina Highway Safety Research Center identified descriptions of 748 collisions in which unrestrained children were at least a contributing factor if not the direct cause of a collision in their state. There were an additional 309 collisions in which a child in some manner distracted the driver to such an extent that a collision occurred.

When you put your child in a proper restraint system every time he rides in the car, you may be doing more for traffic safety than you ever realized.

ALCOHOL/DRUG STUDY

The Department of Transportation says a study of 500 drivers involved in non-fatal automobile crashes in upstate New York found alcohol, marijuana, tranquilizers, or other drugs in the bloodstream of about four out of every 10.

Alcohol in some amount was found in 25 percent of the drivers, marijuana in 10 percent and tranquilizers in eight percent. Two or more drugs were found in 11 percent of the drivers. Twenty percent of the drivers who participated in the study would have been considered legally intoxicated in most states because they had a blood/alcohol concentration equal to or greater than .10 percent.

The study also determined that these "legally" intoxicated drivers may have been at fault in 74 to 90 percent of their accidents, compared with drug-free drivers, who may have caused 34 to 43 percent of the accidents in which they were involved. The study indicates that drivers found with marijuana in their blood may have been responsible for 54 to 69 percent of their accidents.

All of the drivers who participated in the study voluntarily provided blood samples to a research group after being treated for their injuries at a hospital in Rochester, N.Y. The study found that 38 percent had one or more of the substances in their blood.

In other findings, the report said that the drivers with alcohol or marijuana in their systems tended to be male and under 31. Tranquilizers were found more frequently in drivers aged 25 to 50, and equally among males and females.

The study also found that crashes involving alcohol tended to involve a single vehicle, on curves, and mainly left-hand curves. They occurred primarily between midnight and 6 a.m. on weekends, away from intersections.

how well do you know your car?

In what positions does your car key lock your steering wheel? That may not seem like an important question at the moment, but if you were driving down a mountain road it could become all-important suddenly.

In the May 1982 DRIVER article "In and Out of Tight Spots" (page 11) we told you: "You're going down a mountain road and approaching a curve. You step on the brake pedal and it goes to the floor without affecting your speed. There's a sharp drop on the left and on the right and a steady decline ahead. You're picking up speed fast. Now what?"

DRIVER recommended "Downshift to low range, turn off ignition, use parking brake and look for a section of the mountain you can scrape against to stop."

There was immediate panic among several readers as they envisioned their steering wheel locking. These readers are people who know their cars and realize what happens in each key position.

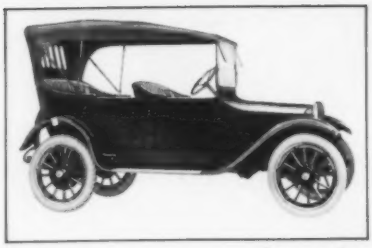
One of the first safety laws passed by Congress was that ignition switch patterns would be standardized. The standardized five-position ignition switch pattern is: START, ON, OFF, LOCK and ACCESSORY. On some vehicles, ACCESSORY has been included into the OFF position for a four-position switch.

In some cases the OFF position does lock the steering wheel, while in others it does not lock the steering. If you check your car and find that the steering does lock in the OFF position, check with your local dealer to see if it should. If it is not supposed to, you have a malfunction that should be corrected immediately.

Meanwhile, back to *your* no brakes trip down a mountain road: Unless you have a car that was built before locking steering wheels came into vogue (or have one of the few models that have transmission locks instead of locking steering wheels), do NOT turn off the ignition. When you're dragging your car against a mountain side or guardrail there isn't going to be too much difference between having your engine off or at an idle.

Do you think these machines will change much by the end of the century?

What's to change? 4 wheels and an engine are 4 wheels and an engine.



1900

1910

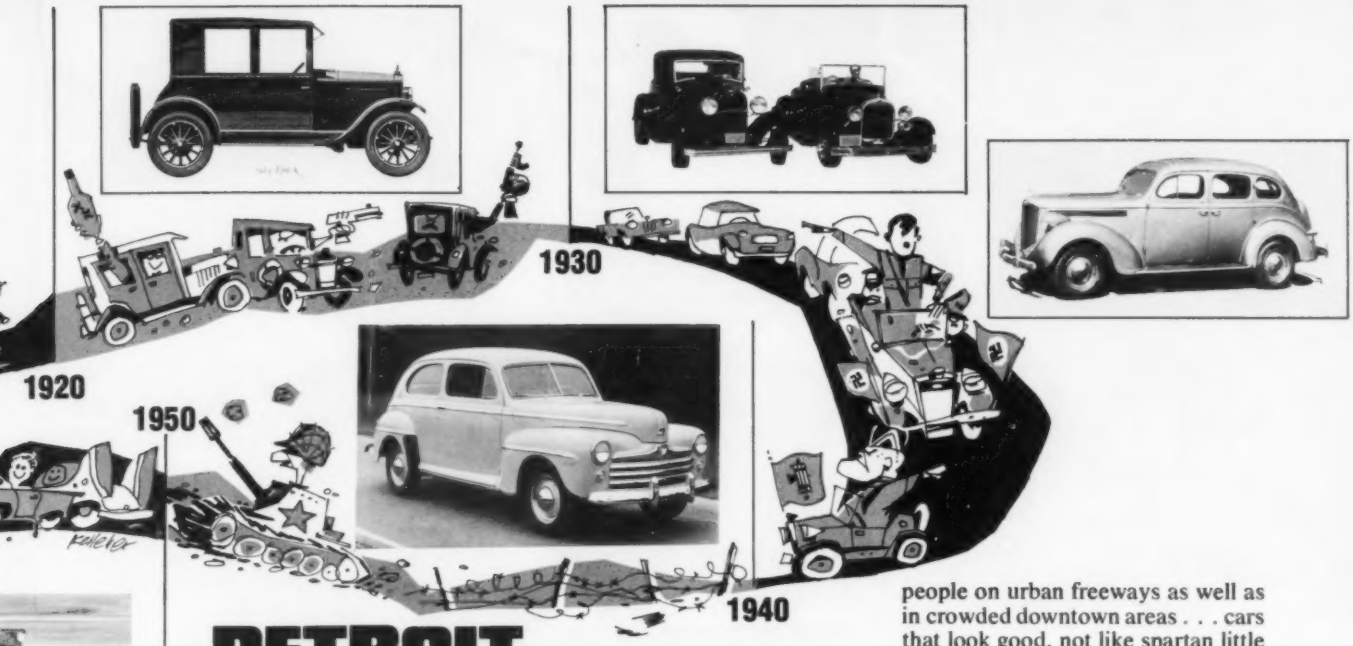
1960

1970

1980

1982 — Methanol-fueled vehicles such as this Ford Escort are being tested by Detroit's automakers along with other alternative-fueled vehicles running on diesel, methane and propane. These alternative fuels can represent savings of 5 to 25 percent over gasoline come 1990.

1983 — Luxury cars of the mid-1980s such as this Continental Concept 90 look remarkably similar to experimental safety vehicles of just a couple years ago for good — read "safe" — reasons.



DETROIT IS PLANNING AHEAD

There's a myth that Detroit automakers don't plan ahead. This may have been true a few years ago, but today American manufacturers are leapfrogging into the future with fuel-efficient, package-efficient cars that will be safe. Cars people will want to own . . . cars that will be comfortable . . . cars that will serve people on urban freeways as well as in crowded downtown areas . . . cars that look good, not like spartan little boxes.

Don't expect massive advances in safety; the technical safety innovations are pretty much state of the art in today's vehicles. Tomorrow's safety comes more from accident avoidance than crash survivability.

Tomorrow's cars will have soft, friendly interiors that provide plenty of protection in case of accident. And the comfort of wearing tomorrow's "accommodating" belts has to be experienced to be believed.

But tomorrow's real safety comes in vehicles that are more responsive to the driver's demands to change direction and come to a stop. Tomorrow's safety is designed in to include improving the driver's vision of the road in front of and to the sides of the vehicle. Advances in mirror placement for rearward vision are also being pressed into advanced design.

Flush windows that improve airflow over the vehicle and influence fuel economy also provide the driver with a better view of the traffic environment. Even the instrument clusters have been ergonomically* designed with easy-to-reach controls surrounding soft steering wheels for better, uncomplicated operation.

Tomorrow's cars are more than backroom dreams in Detroit — they are almost here for all of us now.

1985 — The "fast front" silhouette provides highly efficient aerodynamic characteristics for the Aerovan as well as good driver visibility. It also has unique vent windows that further increase the driver's field of vision. Believe it or not, Aerovan is built on an Escort platform, but can accommodate seven passengers, and with the rear seats folded down, it has as much load space as today's mid-sized station wagon.

1990 — With the engine just ahead of the rear wheels, Quicksilver's weight distribution is equalized for better road stability and handling. Also the front hood can be lower for this sporty appearance on a four-door, five-passenger sedan.

Ergonomics is the science of human factors engineering – or in the automotive business trying to make one-size-fits-all interiors.

FRANK and
WOT ARE YOU BUILDIN' OLLIE ?
MAD SCIENTISTS & LAWN SERVICE
STOP CALLING ME 'OLLIE'! I'M DOCTOR FRANK, YOU'RE DOCTOR STEIN, AND I AM BUILDING AN AUTOMOBILE ACCIDENT!
AN AUTOMOBILE ACCIDENT? 'OW DO YOU DO THAT, OLLIE?
BY PUTTING TOGETHER THE RIGHT PARTS, DUMMY...
SMACK!
SMACK!
I THOUGHT YOU'D NEVER ASK...
...FOIST, YOU NEED A 20-24 YEAR OLD MALE...
'APPY BIRTHDAY TO THE 1958-1962 MODEL KID...
...WHO IS TAKEN DRUNK ON A SATURDAY AFTERNOON IN AUGUST AND WHO TAKES IT INTO HIS BEFUDDLED AND BOOZY BEAN TO VENTURE FORTH ONTO THE PUBLIC HIGHWAYS AND BYWAYS...
EEK!!!
EEK!!!
'OW CAN 'E DO ALL THAT IF YOU'VE ONLY JUST BUILT 'IM, OLLIE? WON'T 'E NEED A DRIVER'S LICENSE ?
YES HE WILL, WON'T HE? THAT MEANS A QUICK TRIP DOWN TO THE GET-A-DRIVER'S-LICENSE PLACE...
BUT FOIST, A BIT OF THE BUBBLY TO WET THE BABY'S HEAD...
GOO GOO
RATTLE RATTLE

STEIN
GRRROWL!
THAT'S A MONSTER, OLLIE!
... LIKE I DID WITH THE ONE STANDING BEHIND YOU...
EEK 111
HAVE YOU EVER SEEN AN ACCIDENT THAT WASN'T?
WOT IS THAT !SHRIEK! 'ORRIBLE THING?
SCREAM!!
EXOTIC FUELS & BLACKSMITHIES
...TO DO HIS MONSTER THING AT HIGH SPEED IN A PASSENGER CAR TO A COMMUNITY OF UNSUSPECTING MOTORISTS... GASP BETWEEN 3 AND 4 PM WHILE HE'S STILL WITHIN 25 MILES OF HOME, WITH HIS SOLID LEAD FOOT FLOORBOARDING THE GAS PEDAL...
HE CLOBBERS SOMEBODY...
Chug a Lug LAGER
YUM YUM
CHORTLE CHORTLE
CHUG CHUG
'E DONE IT, YER WORSHIP! ME DRUNKEN OLD DA-DA RAN A RED LIGHT AND BENT THIS LOVERLY LITTLE BIRD...
LET ME GET THIS DOWN. "SATURDAY, AUGUST 21, 1982, 3:15 PM, 50 YEAR OLD DRUNK DRIVER" WHAT ELSE?
'E'S ONLY 2 BLOCKS FROM 'OME...
NO NO
HERE'S ANOTHER FINE MESS YOU'VE GOTTEN ME INTO! "... WON'T 'E NEED A DRIVER'S LICENSE"
MAMMPH!
SMACK
KELLEHER

double tech tteecc!h

with tish ron lathrop

COMMENT: My 1967 full-size car has a recent alignment, balanced radial tires, new bushings throughout the front end, and new or good front wheel bearings. Yet both front tires are wearing on the outer edges. The mechanic says it's the ball joints — as they're the only thing left to replace. Do bad ball joints cause symmetrical wear such as I've described? Also, I had the front end frame straightened to account for age sag from engine weight. Before straightening, the mechanic said the car was impossible to align. The straightening was done before all the other work.

REPLY: Excessive outer edge wear is usually a sign of too much positive camber. Bear in mind that it takes a whole lot of incorrect camber to greatly accelerate tread wear. On the other hand, bad ball joints allow the camber to change slightly by first loading one side of the tire and then loading the opposite side of the same tire. The result is a cupped, dished or scalloped tread wear. Because of the massive amount of incorrect camber it takes to wear a tire's outer edge, I suspect that something in the front end is in wrong. I've seen parts put in upside down or backwards cause such wear problems — and even parts that fit but were the wrong year. You're going to have to find somebody that really knows front ends or is very familiar with your make car to get this one back on track.

COMMENT: At my former duty location (sea level) I was getting excellent gas mileage with my 1977 half-ton van. The six-cylinder was delivering 18-20 mpg on the highway, and 14-15 mpg around town. After arriving at my new, 6,500-foot duty station I noticed my gas mileage almost drop to half along with the power. I've gotten many different theories on what to do to compensate for the high altitude, advance timing, hotter burning plugs, smaller jets, etc. Before attempting any of these I would like your opinion on the subject. Will my gas mileage ever be as good as it was at sea level?

REPLY: Your gas mileage probably won't be what it once was. There is no one answer for adjusting vehicles to higher elevations. Different engines require different adjustments. On some the timing must be advanced, on others retarded. And the carburetor adjustments are really varied. You would be best advised to check with your local authorized dealer; the mechanics there should know what delivers the best results.

COMMENT: My 1980 sporty sub-compact has a very bad front disk brake squeal along with excessive brake pedal pressure to stop the car at low speeds (under 35 mph). Mechanics at the shop here can't seem to correct it. There is still 70 percent of the brake pad left after 20,000 miles.

REPLY: Did the brakes get used hard when the car was brand new? If so, the pads could be glazed. However, it is more than likely the problem is caused by the type of lining you have. Change the pads and also replace the rubber bushings in the calipers and apply a small amount of grease (usually supplied with the new brake linings) to the bushings and guide pins. If the pedal pressure is still high, you have a malfunctioning power assist unit — start by looking for a vacuum leak.

COMMENT: I've just purchased a diesel and am considering switching to a synthetic oil. Do you advise synthetic oils for diesel engines? Do the manufacturers?

REPLY: Using or not using synthetic oils is a personal choice and I will not recommend one way or the other. The manufacturers make their recommendations in the owner's manuals that come with cars. You'd be better off asking the service manager at your local authorized dealership for his advice.

COMMENT: One of the first points made in the article about jump-starting a car in the March 1982 DRIVER was that most people do it wrong. The fact that the negative booster cable should be attached, not to the negative terminal on the discharged battery but grounded away from the battery, was pointed out as the safest method. The illustration that accompanied the article was cute, but showed the connections all as terminal to terminal — which, as you said, is wrong. What about disconnecting the alternator on most models? Is that still required?

REPLY: You're right: in our effort to attract readers to the article we used cute art work (not a technical illustration) that wasn't correct. If the booster battery is connected properly (positive booster cable to positive terminal and negative booster cable to vehicle ground) there is no reason to disconnect the alternator. However, when using a fast charger on a vehicle battery there are some precautions. If the fast charger is equipped with a special alternator protector the vehicle battery cables needn't be disconnected. But should the fast charger not have this feature, the battery cables will have to be disconnected.

COMMENT: Everytime I step on the brakes I get a negative reaction from my amp gauge. If I come to a stop, the reaction stays negative until I accelerate again. This is best seen visually at night when I turn on my lights because the lights outside as well as in the dash will flicker for just an instant. They will stay slightly dimmed at a stop. The more power demands I place on the system, the more pronounced the problem. I thought it was the voltage regulator located inside the alternator so I replaced it. The problem eventually degenerated to the point where I replaced the entire alternator. Same result.

The base garage said the gauge wiring my brother did for me was crystallizing, so they replaced that. Then they said it was a rear brake light bulb which had a loose base and replaced that. The problem persisted. So they put in a beefed-up alternator. That was about three years ago and the flickering never did stop and the problem seems to be degenerating again. Sure could use some good advice before I have an electrical failure out in the boonies.

REPLY: Basically I suspect your ammeter wiring is improper or you have a defective gauge. If you have wired into the circuit that originally included the "idiot light," the fact that the light bulb is inoperative will cause the alternator output to be very low or zero at idle. Having the wrong light bulb in the cluster has even been known to create this problem. For locating trouble in an electrical system I prefer a voltmeter to an ammeter. Sometimes when an ammeter is connected in a circuit, the cause of the trouble is the connections. With voltmeters it isn't necessary to disconnect any wires to make tests.

EDITOR'S NOTE: If you have a general interest automotive comment or question that you would like a reply to, and feel others could use the knowledge also, send it to:

DOUBLE TECH
HQ AFISC/SEDD
Norton AFB, CA 92409

Be sure to include all available information which may help in finding the correct solution.

HOW IT HAPPENS!

A sergeant, two airmen and an infant dependent are traveling on the highway through a wooded area. They have just visited the sergeant's husband and are returning to their own base. As they come around a curve, they see a deer standing on the highway. The sergeant swerves to avoid the deer and loses control of the car. The car rolls two and a half times and rests on its top. The infant is in a child carrier and stays inside the car, uninjured. The others are thrown out of the car, and one of the airmen is pinned under the automobile and dies of her injuries.

Would this accident have happened if the driver had been more alert? Would it have happened if the car had been moving more slowly? If all the occupants had been belted in, would they have all been uninjured?

motorcycle maintenance

PART 2

Compress the front shocks with a combination of down pressure and the front brake, then extend the units quickly to test damping force. If there's no difference in the effort required to operate the unit quickly or slowly, it's replacement time.

The principles are easy, it's the chain that's greasy.

A safe machine contributes as much to motorcycle safety as operator skill and knowledge. Everyone will agree that skill and knowledge are the rider's responsibilities. But who is responsible for the safe machine? The rider, that's who.

As a motorcycle operator you are individually responsible to yourself, your passengers, your loved ones and all those around you to have a safe vehicle. And in order to have a safe motorcycle it must be maintained in a safe operating condition.

In part one of this two-part mini-series on Motorcycle Maintenance (in the July issue of DRIVER) most of the emphasis was placed on the engine. Of course, without an engine a motorcycle becomes an awful handful to push like a scooter. Keep that in mind. As the old adage goes, "An ounce of prevention is worth a pound of cure."

the backyard mechanic

back to basics

So it is with motorcycle maintenance. Preventive maintenance (inspecting, adjusting and cleaning) will usually cost less in the long run than corrective maintenance (repairing something that's gone wrong). "Cost less" includes not only dollars and cents, but time, patience, as well as life and limb.

Those who've read part one of this series may find the next few lines redundant, but pay close attention anyway. There will be a test!

Instead of getting to the point where a father-like image suddenly says, "If all else fails, read the instructions," why not start at the beginning first. The first step being: Follow the owner's manual instructions. This manual is full of time-and-money-saying advice. In addition to telling you how to operate and maintain your cycle, it provides tips on diagnosing trouble, keeping up the appearance and getting service.

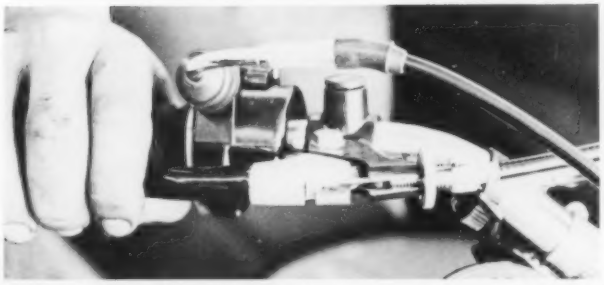
Don't just refer to the owner's manual when necessary, take the time to read it cover to cover beforehand.

Home workshop tools should include: combination wrenches, socket wrenches, assorted screwdrivers, pliers, feeler gauges, spark plug gauges, spark plug wrench, small hammer, plastic mallet and parts cleaning brush. Several of these tools will be

continued

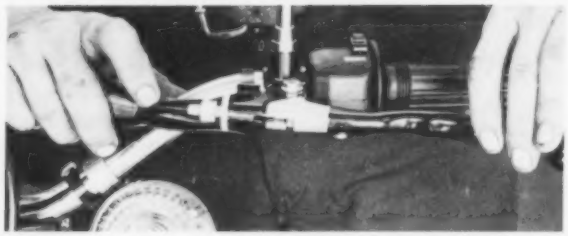
Spokes should all offer the same resistance to your squeeze. Tighten those that don't and immediately replace those that are bent or stripped.

Check the travel in the rear brake pedal and then adjust with the nut on the end of the rod.



By the time you've got the front brake lever this far compressed it should stop. Also make sure it releases to a point that the shoes don't drag.

continued



The clutch lever should have a very little free movement before starting to move the cable to avoid slippage.

used for engine work only as is the case with most of the specialized tools that are required for motorcycle maintenance. These specialized tools are: Flywheel puller, timing gauge, ignition gauge, timing tester, hydrometer, multimeter or VOM, compression gauge, impact driver and carburetor synchronizer (for multi-carburetored motors).

The most important tool in the work shop, however, is the service manual for the make and model machine you're maintaining.

You'll also need another tool kit. This is the basic tool kit you always carry on the bike. Be sure your owner's manual is part of this. Most dealers have small road-side emergency tool kits. If you're making your own bag, however, you'll probably want to include 10x14mm, 17x19mm, 9x12mm and 10x13mm open-end wrenches, a spark plug wrench, pliers, slotted or common screwdriver, and two sizes of Phillips screwdrivers.

Don't forget expendable supplies. These include: grease, oil, gasket cement, wiping rags and cleaning solvent. They're available at the Exchange, local gas stations or auto parts stores. A can of penetrating oil can usually be helpful.

Before doing anything with a motorcycle, you should read the entire section covering that job in the manuals. Even if it's only a check or inspection. You wouldn't want to miss something that could end up breaking your machine – or you. Study the section and have a good idea of what's involved before tackling the project. This will help you have all the tools before beginning, as well as uncover helpful hints for step 17 that are hidden in step 59.

It's always easier to work on a clean machine. There are many specialized

Play in the throttle grip should allow you a slight movement with very light pressure before starting the cable to move. This prevents throttle hang up, idling too fast or the heart-pounding *thrill* of more speed when you actually wanted to slow down.

cleaners for washing oily or greasy parts. But remember when using them to make sure the work area is well-ventilated and to have a properly rated fire extinguisher handy.

Never use gasoline as a cleaner. The fire hazard is too extreme. Besides, there are many, many more effective cleaning solvents available that cost much less.

As the engine was covered in part one of Motorcycle Maintenance you'll find that you're just a few short steps away from safe cycling. The next step is chassis service. And because chassis service is simply routine checks and inspections that you should already be performing daily or weekly, it is surprisingly quick and easy.

Start with the tires. Check the inflation. Then look for cuts as well as excessive and uneven wear.

Wheel spokes should be checked for tightness. If you have something other than the technical editor's tin ear you can use a tuning fork method. That is, tap each spoke with a spoke wrench or screwdriver, listening to the tone of each. A tight spoke will give a clear, ringing tone whereas a loose one will sound flat. "Ting" is good; "tunk" ain't. All spokes in a correctly tightened wheel will sound similar, but not precisely with the same pitch. For the untrained ear and the tone deaf it is better to grab the spokes two at a time noting if they both offer the same resistance to your squeeze. Better yet, check each spoke with the spoke wrench.

If you find a bent or stripped spoke, replace it at once. Remember to check the new spoke more often than the others. It will be stretching and will require tightening several times before it finally sets.

Also check the rim for bends or dents. Because severe rim damage is difficult to repair successfully, it's wiser to replace it. Anytime you have the tire off the rim, check the rubber rim band. If it's torn exposing a spoke, replace it or temporarily repair it with tape.

As long as we're on our hands and knees, let's adjust the brakes. There's an adjusting nut on the end of the front brake cable and rear brake rod to help make the job easy. If wear makes it impossible to get a satisfactory adjustment, the brake arm may have to be repositioned on its splined shaft.

However, before doing this you'd better make sure the lining hasn't worn down too far. Following the manual's instructions, remove the wheel and open the brake up. As a general rule, replace the brake shoes when the lining is worn down to the rivet heads, or on shoes with bonded lining, when the thinnest part is .08-inch (2mm) or less thick. If the shoes have become glazed, light sanding with coarse sandpaper should solve the problem. If there is any grease or oil on the braking shoe surface, replace both shoes immediately. While you're at it, check the drum surface for scratches. Any scratch deep enough to catch a fingernail is cause for turning or drum replacement. Disc brakes are usually well covered by owner's and service manuals.

Moving to the handlebar, check the throttle, clutch and brake cables for chafing and smooth operation. This includes making sure the levers also operate smoothly. Next check the bar itself for bends or cracks—especially after an accident or hard spill. Now's as good a time as any to check all the switches to assure they turn on and off whatever they are supposed to control. Always check the throttle grip for free operation and sticking. Make sure the adjustment allows a little play between the stop and cable movement. This will keep the throttle from getting hung up and causing your engine to idle too fast or power you ahead faster than you intend to go.

Check and tighten the mirrors, too.

Check the shock absorbers' damping force by attempting to compress and extend the units quickly. If there is no marked difference between the effort required to operate the unit quickly or slowly, or if there are any oil leaks, replace the shocks.

Check the steering for too much free play or excessive tightness. If there is a steering stem problem remember that a bent shaft will mean replacing the entire assembly. If you replace the ball bearings, never combine new and used parts. Replace the entire bearing assembly if any defect is found.

Tighten nuts and bolts while checking for bends, breaks and dents on the frame and fender. This includes assuring that the seat, windshield and fuel tank are properly secured. It won't hurt to check and tighten engine nuts and bolts now either. And make sure all the lights are operational and the headlight properly aimed.

Take a moment to check the electrical wiring system for loose ends, disconnections and worn insulation.

Probably one of the most neglected items on most bikes is the chain. It must be cleaned frequently, lubricated and properly adjusted if it is to provide a reasonable service life. Yet without it, that engine that we spent the entire part one of Motorcycle Maintenance on won't turn a wheel a single inch (except on those bikes with shafts, of course).

As we are probably all guilty of neglecting our chains, let's do the following steps in unison—especially you. Yeah, you with the Triumph Bonneville!

Disconnect the master link and remove the chain. Immerse the chain (if it isn't already worn out) into a pan of cleaning solvent, allowing it to soak for about half an hour. Now scrub the roller and side plates with a stiff brush and rinse the chain in clean solvent to carry away loosened grit. Hang it up and allow it to dry thoroughly. Now check it for wear or damage. If there's any doubt about its condition, replace it.

OK, before we put it back on the bike and adjust it, lubricate the chain with a good grade of chain lubricant, carefully following the lubricant manufacturer's instructions. Now reinstall it, using a new master link clip installed so that the open end is on the tail of an imaginary arrow pointing in the direction of chain travel. Always give the lubricant a few minutes to soak into the chain before riding the bike. There is no sense in lubricating a chain only to have the fluid thrown off 30 seconds later as the sprockets whip it around.

To adjust the chain, first loosen bolts on both ends of the brake anchor. Loosen the brake adjustment nut several turns. Now loosen the rear axle nut. Then turn the adjuster nuts in or out equally until the adjustment is correct. Sight along the top of the chain from the rear of the bike to check wheel, chain and sprocket alignment. There shouldn't be any bends in the chain.

continued

help with part one

What's wrong, Bunkie? Did you enroll in a correspondence school to become a psychiatrist? And they sent you part one of psychiatry and part two of motorcycle maintenance? Now you can't help people with their split personalities or fix your motorcycle engine? But you sure can cure a Honda that thinks it's an International Harvester combine!

Is that your problem, Bunkie?

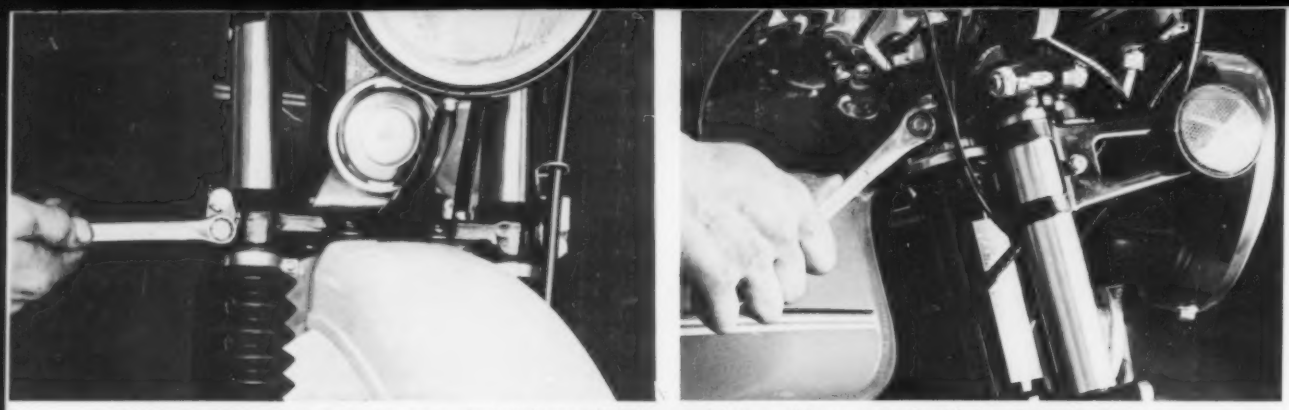
Well, I sure can help you!

If you missed part one of Motorcycle Maintenance and can't find, beg, borrow or steal a copy, here's the best piece of advice contained in part one: Buy a service manual for your make and model of motorcycle. If your dealer doesn't have any for sale, check the ads in most any national motorcycle magazine. You'll find firms that specialize in such publications.

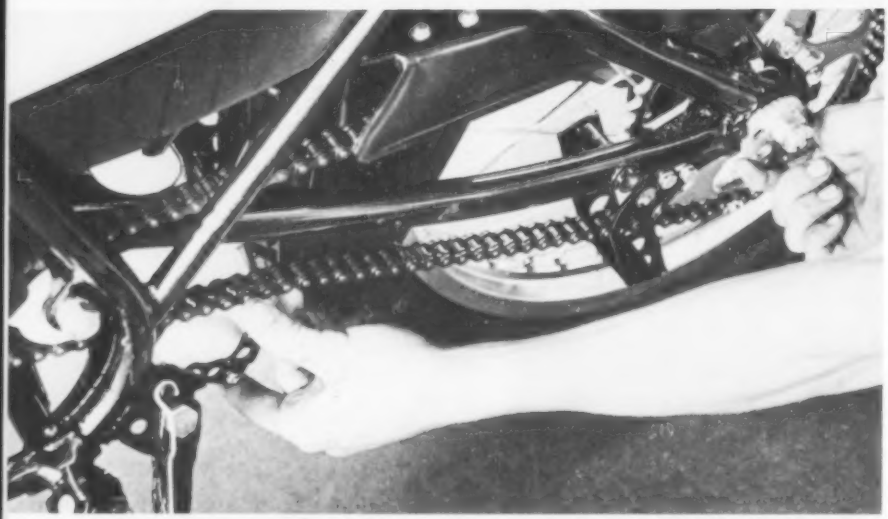
Remember, the service manual is the best tool in your inventory. Worth every penny you pay for it.

Do you feel better, Bunkie?

Always check the steering stops, making sure that none of the cables, wires or hoses can be caught between these two blunt "cutters."



Make sure all nuts and bolts are properly tightened. This is especially true of those on the front fork and steering stem.



From ¾ to one inch of play is necessary in the drive chain. Be sure to move both adjusters equally. Always check the alignment before tightening everything down again.

Now recheck the vertical play, turning the adjuster nuts equally to get it correct. Finally, tighten the locknuts.

All right, one last check list before cranking the engine. Check:

- **Engine oil supply**
- **Transmission oil supply**
- **Clutch oil supply**
- **Clutch adjustment**
- **Valve adjustment**
- **Throttle cable adjustment**
- **Drive chain adjustment**
- **Engine mounting bolts**
- **Ignition timing**

OK, the machine should be safe to operate. But what happens if it breaks down? Well, first of all, most problems give early warning signals. Learning to recognize them can save a lot of trouble. Some of the more common warning signals include:

Troubleshooting seems to center around the spark plugs. Since the electrical system is the weakest link in the three basics required for any engine to run, more problems are electrical than anything else. Besides, as pointed out in part one of Motorcycle Maintenance, the plugs have a story to tell about engine condition. Learn to read them.

- **Excessive noise or vibration.**
- **Loss of shock damping effect.**
- **Sticking or hard-moving parts, particularly brakes, clutch, cables and steering.**
- **Excessive smoke.**
- **Pulling to one side.**
- **Engine hesitation, lack of power or sluggishness.**
- **Gear shifting difficulties.**

"Fine," you say, "but I'm stranded out here 50 miles from the nearest person. I need to be able to find the problem now and get moving again."

You're in luck. Most motorcycle problems are relatively simple to figure out using orderly procedures along with a few basic principles. In other words, don't overlook the obvious.

If you're traveling along and the bike suddenly stops, check to see if you have fuel. If so, is the petcock on? Maybe a spark plug wire fell off. Or, believe it or not, has the weight of the key ring vibrated the key into the "off" position?

A word to the wise: Bikes don't quit because something is slightly out of adjustment. If you start turning screws, you may never get the bike to run right again. Leave the screws for fine tuning a running machine.

Even if you aren't able to locate and solve the problem yourself, being able to recognize and describe symptoms will make a mechanic's job easier.

On the other hand, you don't need fancy equipment or complicated testing rigs to determine if the repairs can be attempted at home. A few minor checks might save a large repair bill. At the same time you must be realistic. Don't attempt repairs that are beyond your abilities. You might cause more

damage than any service department could ever repair. I've seen service managers take one look at "basket" cases and tell the downtrodden backyard grease monkey that he'll think about repairing it once the fumble-fingers who pulled it apart reassembles the pieces.

Three basics are required before any engine will run: a correct gas/air mixture, compression, and a spark at the right time. If one of these three is missing, the engine won't run. Because the electrical system is the weakest link in the pattern, more problems are caused by electrical breakdowns than any other source. Keep that in mind before tinkering with the carburetor.

Generally, lack of compression is apparent because of a history of power loss as well as harder and harder starting.

Problem: The bike is difficult to start.

Troubleshooting: Check to see if there's gas in the tank. If so, pull the fuel line off at the carburetor. If gasoline doesn't flow out freely the tap may be shut, blocked with rust, dirt or leaves, or the line kinked.

If there is fuel at the carburetor, turn to the electrical system. Is the battery charged? If that isn't the trick, check the spark plug. After removing the cap, pulling the plug and reinstalling the cap, lay the plug against the head, making a good ground with the plug base. A fat, blue-white spark should jump across the electrodes when the engine is cranked briskly. A weak spark, or none at all, indicates an electrical system problem. Check for a defective spark plug by replacing it with a known good one (not all new plugs are good).

Clearing the plug of blame, start backtracking through the system. Hold the plug wire about ⅛-inch from the head while the engine is being cranked over. Be sure you're holding the wire by the insulation to avoid a nasty shock. Wrap a dirty, greasy or wet wire with a rag to avoid getting shocked. If you get a shock or see sparks along the wire, look further.

If there's no spark at the wire, look for a loose connection at the coil and battery. Next check for oily or dirty points. Now check for a spark at the points. If there is none, there is an ignition system failure and you are going to need a manual with a good troubleshooting section to trace the problem.

a word from our sponsor

There is no sense in getting hurt while maintaining your bike. Especially when just a few seconds of thought will prevent almost all possibility of accident.

Here are a few hints to help get your common sense up to speed and thinking for itself.

- Never use gasoline as a cleaning solvent.
- Never smoke or use a torch near flammables such as cleaning solvent in open containers.
- Never smoke or use a torch near a charging battery.
- When welding or brazing on a bike, remove the fuel tank to at least 50 feet away. (Drain the carburetor(s), too.)
- Use the proper size wrenches when turning nuts and bolts.
- When working on a tight nut or bolt, think what would happen if your hand slipped.
- Keep the working area clean and uncluttered.
- When drilling, grinding or using a chisel, wear safety goggles.
- Never use worn tools.
- Keep a fire extinguisher handy that is rated for gasoline and electrical fires.

Also remember that wrong heat range plugs will contribute to starting problems. Make sure any plug is properly gapped.

Back to "not assuming anything." If you've just ridden through a puddle or just washed the machine, you'd better dry off the plugs and wires.

If there is a good spark at the right time then it's on to the carburetor. Often dirt will cause the float to stick, flooding the carburetor. To temporarily clear the carburetor, rap it with almost any convenient object and crank the engine at full throttle. If you are sure it's the carburetor and you still haven't solved the problem it's disassembly time. After making sure the jets and air passages are clear, check the float level. Make sure the carburetor is mounted snugly so that no air leaks past the manifold. How about that air cleaner? Is it clogged?

Finally, if you need a compression test in the middle of nowhere, turn the kickstarter by hand to see if there is adequate resistance. Or remove the spark plug, place your thumb over the hole and feel for pressure.

Problem: The machine idles poorly.

Troubleshooting: Incorrect carburetor adjustments, incorrect timing and ignition system defects cause poor idling. A couple of other trouble makers are obstructions to the gas cap vent and leaking carburetor mounts.

Problem: The engine is misfiring.

Troubleshooting: Start by checking for dirty or weak plugs. Next look for contaminated fuel. Run the machine in a dark garage or at night to see if the spark isn't leaking along the wire before reaching the plug. If you need to do this test during the day, slowly move a small piece of white note paper between the wire and anything it can short into, watching for the jumping spark to burn a hole into the paper.

If the misfiring occurs only at certain throttle positions, check the manual for carburetor troubleshooting details.

On the other hand, misfiring while accelerating or climbing hills is usually pointing directly to bad plugs.

continued

continued

Don't assume anything. If you have fuel and the bike won't start, is the tap open? If it's a two-stroke engine and you left the petcock on overnight, it may not start because the crankcase is full of raw gasoline. Turn it off when not in use.

Problem: The engine seems to die momentarily when the throttle is opened and then catches on and runs.

Troubleshooting: Check for dirt in the main carburetor jet, water in the fuel or an extreme lean mixture.

Problem: Bike seems to develop less and less power.

Troubleshooting: Check the ignition timing. Other than that, this is the sign that you're losing compression. In other words, it's about time for rings, pistons, a valve job or a complete upper end overhaul.

Problem: The engine backfires.

Troubleshooting: Is the timing advanced too far? Is the fuel contaminated?

Problem: The engine seems to be running too hot all the time.

Troubleshooting: Because most cycle engines are air-cooled, heavy stop-and-go traffic can be murder since little air passes over the fins to keep temperatures down. Riding in too high a gear is also a problem.

Wrong heat range spark plugs tend to burn pistons. An excessively lean mixture may also cause overheating. Compression gases leaking past broken or worn rings heat heads and cylinders excessively.

And, of course, if the oil level is low or the wrong grade, overheating will follow.

As your experience with any machine grows, your "troubleshooting" ability will also increase. Using orderly procedures along with the basic principles will usually make most motorcycle problems easy to solve. However, they are not the final answer. Sometimes the solution is in the owner's or service manual. However, for the more difficult puzzles a dealer's service shop will have to be consulted. Here again your growing troubleshooting expertise will contribute to the details you describe to the service people about conditions and circumstances under which the problem occurred.

Having done your own maintenance, or at least knowing how it is done, and being responsible and mature enough to recognize mechanical problems, you're well on your way to safer cycling. Enjoy.

DRIVER wishes to thank Bob Amaral of Dale's Modern Cycle, San Bernardino, Calif., for his assistance in the preparation of this article.

Staring at it won't get you back on the road. Use orderly methods with basic principles and you'll find most motorcycle troubles are relatively simple to figure out.

do it yourself service

Every bike requires regular service and lubrication. There are a number of jobs that you can do yourself. Your owner's manual will tell you when (at how many miles) these are required. But remember that when you ride at sustained high speeds or under adverse conditions, service is required more often. This is especially true in case of dumping the bike or a collision. In the latter cases you'll probably want the dealer or an expert to examine the machine.

Although most of the regular service was covered in part one, here's a quick review of the items and service necessary for safe cycling.

Quickie quiz

1. What's the most important tool in your work shop?

a. The telephone for calling for "help."
b. The bike's service manual.
c. An extra large hammer.
d. The six-pack for afterwards.

Answer: The service manual for the make and model machine you're working on is probably the best tool you'll ever have.

2. Why isn't gasoline a good cleaning solvent? _____

Answer: If we have to help you fill in the blank above on why gasoline is a "no-no" as a cleaning solvent, then we want you to turn in your Backyard Mechanic non-union card and go watch television before you hurt somebody. You are FIRED!

3. According to the author, the most neglected item on most bikes is:

a. The owner b. The payments c. The chain d. The license plate

Answer: The chain, although all the others seem to heap much abuse.

4. The bike won't start. What's the first thing to check?

a. The time (to see if you have two days to get it to a shop for repairs).
b. The garage, to see if the spouse left with the car yet.
c. The timing.
d. The tank, to see if there's any fuel.

Answer: Never assume anything when troubleshooting. Make sure you have fuel first.

5. Having read parts one and two of Motorcycle Maintenance I am now:

a. An Expert motorcycle mechanic.
b. Ready to buy a car instead.
c. Better qualified than Bart Markel or Roger Reiman as a professional racing mechanic.
d. Sure that to ASSUME in motorcycle troubleshooting means: All Stops Suddenly; Unsatisfactory Motorcycle Experience.
e. None of the above.

Answer: E. Motorcycle maintenance is a learning experience that requires your participation, not just a reading exercise.

You were promised a test, right? Well, here it is, in the form of a learning tool. The answers immediately follow the questions to help reinforce the correct response.

- Engine Oil—Change.
- Oil Filter—Clean or replace.
- Spark Plugs—Clean, adjust or replace.
- Air Cleaner—Clean or replace.
- Carburetor—Clean and adjust.
- Fuel Tank and Fuel Lines—Check and clean.
- Fuel Valve Strainer—Check and clean.
- Clutch—Check or adjust.
- Brakes—Adjust play; check or replace shoes and/or pads.
- Front Fork Oil—Check and change.
- Kickstand Spring—Check.
- Oil Pump—Check operation, adjust.
- Exhaust Pipe and muffler—Remove carbon and tighten clamps.

Backfire
LETTERS to the EDITOR

WHAT DO YOU DO?

I read each issue of DRIVER with interest. Here's a question for "Backfire" readers.

What do you do with a driver who:

- Cruises 30 mph under the posted speed on a winding and hilly two-lane road, and has 30-odd cars stacked up behind him?
- Passes a line of cars stopped for a red light on the RIGHT, then cuts diagonally across the intersection and proceeds to drive up a one-way street the wrong way?
- Frequently is seen traveling north in the southbound lane of a divided highway and vice versa?
- Never obeys STOP or YIELD signs?
- Doesn't have the first dime's worth of liability insurance?
- Rarely if ever burns lights at night or in "see-and-be-seen" situations like haze, fog or rain?
- Never drives defensively nor extends the smallest courtesy towards other highway users?

Who is this slob? Who is this pimple on the butt of the traveling public? Who is this "driver" who forces others to take evasive action and sometimes dangerous maneuvers just to ensure his well-being?

Give up? You should have guessed by now . . . it's none other than your average bicycle driver, that's who! And for every one of them that doesn't fit this picture, there are hundreds more that do!

Mr. Bob Hammarstrom
USMC retired
Havelock, NC 28532

TWO CENTS WORTH

I would like to add my "two cents worth" to the debate on using one's parking brake when leaving the car unattended. I live in an area of Germany where the night temperatures can get rather low (Rhoen Mountain area). I used to always engage my parking brake before leaving my car, until I arrived here.

My first experience came about two years ago. I used the brake one night prior to turning in. When I came out to my car the next morning, the brakes were frozen solid. I had to hurry and catch a bus and wait for the weather to warm up a bit so I could move the auto. I once made the mistake of leaving the parking brake engaged while away on a week's leave. Upon my return it took three days to get the brakes to un-seize.

My area is cold, but there are some that get even colder (like "The Rock" at the Wildflecken Training Area). What are we unfortunate souls to do? Do we set the parking brake and risk not being able to move the auto later? Or do we leave the auto in gear and hope it doesn't "run away?"

As a closing note, I'd like to add my name to the list of those praising the use of seat belts. I staggered away from a head-on collision on a local German highway last November. I can only attribute my being alive to the fact that I was wearing my combination lap and shoulder belt. My only injuries were bruises from the belt and whiplash from hitting my arms with my forehead (which in turn hit the steering wheel). My Passat (German version of VW's Dasher) was totaled, but I'm alive to talk about it.

SSgt. James L. Breeden, USA
APO NY 09146

Actually the villain is water. We've had brakes "freeze" up in southern Texas. Often rear brakes are so far out of adjustment that they only touch the drums when the emergency system is in use. As a result they don't generate enough heat to dry themselves during normal use and will freeze or rust in a "no go" position. Make sure your brakes are properly adjusted and remember to "drag" them dry when wet (see "Driving Into Spring" in the March 1982 DRIVER).

AS SAFE AS . . .?

Recently I purchased a metal-to-metal chin strap fastener for my motorcycle helmet. It provides easy locking, quick release and also reduces wear on the strap. The dealer assures me that it is at least as safe as the conventional "D" rings. I find it to be more convenient. Would you please comment on this type fastener?

Mr. Fred W. Young
Ft. Benning, GA 31905

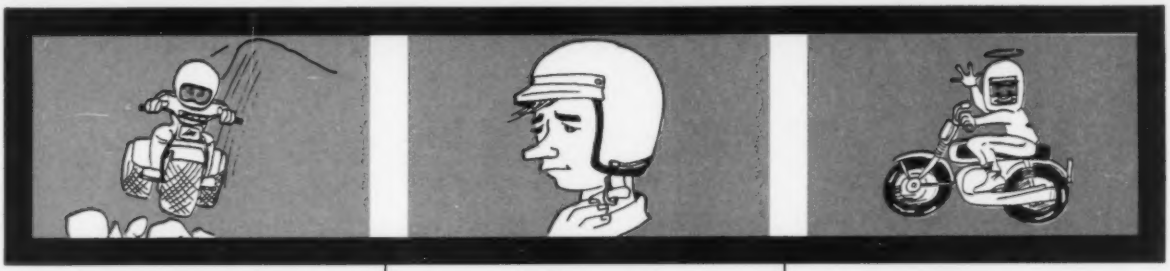
Metal-to-metal chin strap fasteners do NOT provide the adjustment necessary to get a helmet properly fitted. Additionally, there is no visual way to judge when metal-to-metal fasteners have worn out as there is with the "D" rings. As DRIVER said in the December 1981 helmet issue: "Be sure the helmet has a double "D" ring fastener, not snaps."

WHAT WE NEED IS . . .

Mr. Samples' letter in the April 1982 issue regarding bicycles on the road frankly frightens me.

As a motorist, I can certainly sympathize with Mr. Samples' aggravation at inattentive cyclists on the road. But on the other hand as a cyclist, I would like to remind him that while he may be justifiably aggravated or even infuriated at an inattentive cyclist, the cyclist can be severely injured or killed by an encounter with an inattentive motorist.

While in college, my girlfriend was injured when a motorist opened his door as she rode by. It seems he shared Mr. Samples' view since he thought the damage done to his car



door offset her cut up face and knees.

I would also suggest he count the number of automobiles illegally parked in designated bike lanes when he is out driving.

The point is, Mr. Samples, what we need is not some "final solution" of removing cyclists from the road "for their own protection," or a road use tax for "rolling pedestrians" or walking pedestrians who use the road. What we need is a lot of patience, courtesy and understanding on both sides.

If Mr. Samples doesn't agree, I might remind him of the fact that most of the 18-wheelers I've seen don't recognize anyone's right to share the road with them.

Capt. John B. Sims III, USAF
Vandenberg AFB, CA 93437

ONE DAY LATE

Referring to your article in the April 1982 issue titled "Bermuda Tricycle," I got it one day late!!!

A friend of mine needed to read your article. Myself being from southern California, I used to ride down by Palm Springs and in the desert quite a lot. Since joining the Army and being stationed at Ft. Hood, Texas, I brought my ATC® with me.

Cornering on an ATC® is tricky if you haven't practiced. Last Sunday my friend climbed a small 12-foot hill and was cornering at the top against an incline. It resulted in an airborne jump straight down off an embankment of about 14 feet onto some rocks and broken beer bottles.

Luckily he was wearing a helmet with a visor or it could have been very serious. He escaped with a bloody nose and a few lumps. The ATC® is another story.

Practice in an open flat area is important to new ATC® riders, and even veteran motorcycle riders. ATC's® do NOT handle the same as motorcycles.

As far as those egotistical idiots who don't wear helmets because they think they are too good to wreck, they will get it someday. I just hope they will be in the condition afterwards to admit their stupidity.

Safety, even on three wheels, is very important and should be taken very seriously; it is by me. My friend is alive and can remember that he had a helmet on. To those people who own bikes and let friends ride them, have an extra helmet, or give them yours; it could save their lives.

Pfc. Mark Wilson, USA
Ft. Hood, TX 76541

PEOPLE IN CAGES

I have been following the controversy in recent issues of DRIVER about motorcycles versus cars, etc. and have thought about the feelings that I have had while riding.

I had just bought my first new cycle, a Suzuki 1000, and was passing a line of cars waiting behind a left turning car. One car pulled into my lane without seeing me. I hit the rear brake hard and found that (1) the disk rear brake on my new bike grabs harder than the drum brake on my old bike, (2) motorcycles skid when the rear wheel is locked up and (3) that I become very frightened when I drive sideways.

I pulled alongside the woman who had pulled out at the next red light to ask her to be more careful. She was holding her steering wheel with a death grip and refused to look at me. Maybe the sound of a skidding tire, the fact that she could have killed someone, and the big black bike driven by a black-leather-clad biker in a Darth Vader helmet had something to do with her fright. When she wouldn't look at me, I became very angry, put my cycle into neutral and was about to smash her door in before I cooled off a little. I put the bike into gear, jumped the throttle and almost ran over a compact car (they do not accelerate as fast as a 1000cc bike, I'm told).

I pulled off the road to cool off. I realized that (1) she probably could not have seen me to begin with, (2) even if she could have, I still have to protect myself, (3) I was alive and grateful for that and (4) the great Suzuki Rider in the Sky does not want me to hit on other people's property.

Anger and violence have no place riding with me. If I cannot handle my feelings, what makes me think that I can handle 85 horsepower in a 540-pound cycle? And I do not want to be so right that I am wrong. If I hit that pavement because I am in the "right," I am the one who suffers. I would rather tease a rattlesnake with a short stick than get into an ego contest with someone who is surrounded by 3,000 pounds of armor plate. And the next time I think about the people in their cages, I also want to remember the cage that is *not* around me.

Thanks for your great magazine. It helps me.

Lt. Cmdr. Chris Walter, USCG
Washington, D.C.

The staff votes this the best letter in the last six months! Here's a mature, responsible, intelligent individual who almost *let his emotions take control. It can happen to anyone. The only thing that counts is to take charge of those emotions before they cause real trouble.*

Address your letters to:
Editor
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Norton AFB CA 92409

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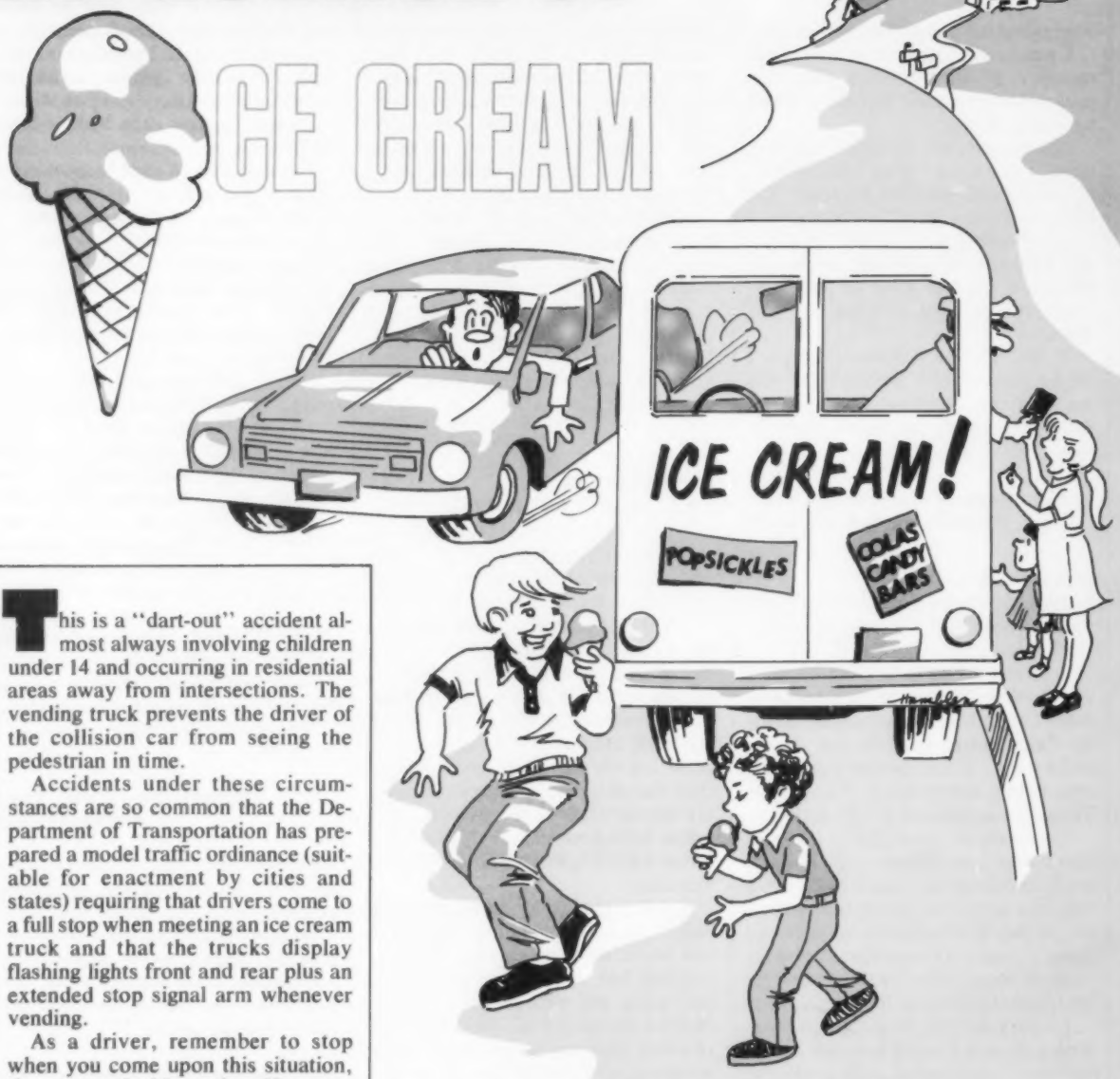
Kids UNDER the INFLUENCE of ICE CREAM



This is a "dart-out" accident almost always involving children under 14 and occurring in residential areas away from intersections. The vending truck prevents the driver of the collision car from seeing the pedestrian in time.

Accidents under these circumstances are so common that the Department of Transportation has prepared a model traffic ordinance (suitable for enactment by cities and states) requiring that drivers come to a full stop when meeting an ice cream truck and that the trucks display flashing lights front and rear plus an extended stop signal arm whenever vending.

As a driver, remember to stop when you come upon this situation, then proceed with caution. If you are a parent, teach your child how to cross the street safely.

(Information courtesy of Lawrence Pavlinski, NHTSA)